



City of San Diego

City Council Presentation

City of San Diego Public Utilities Department

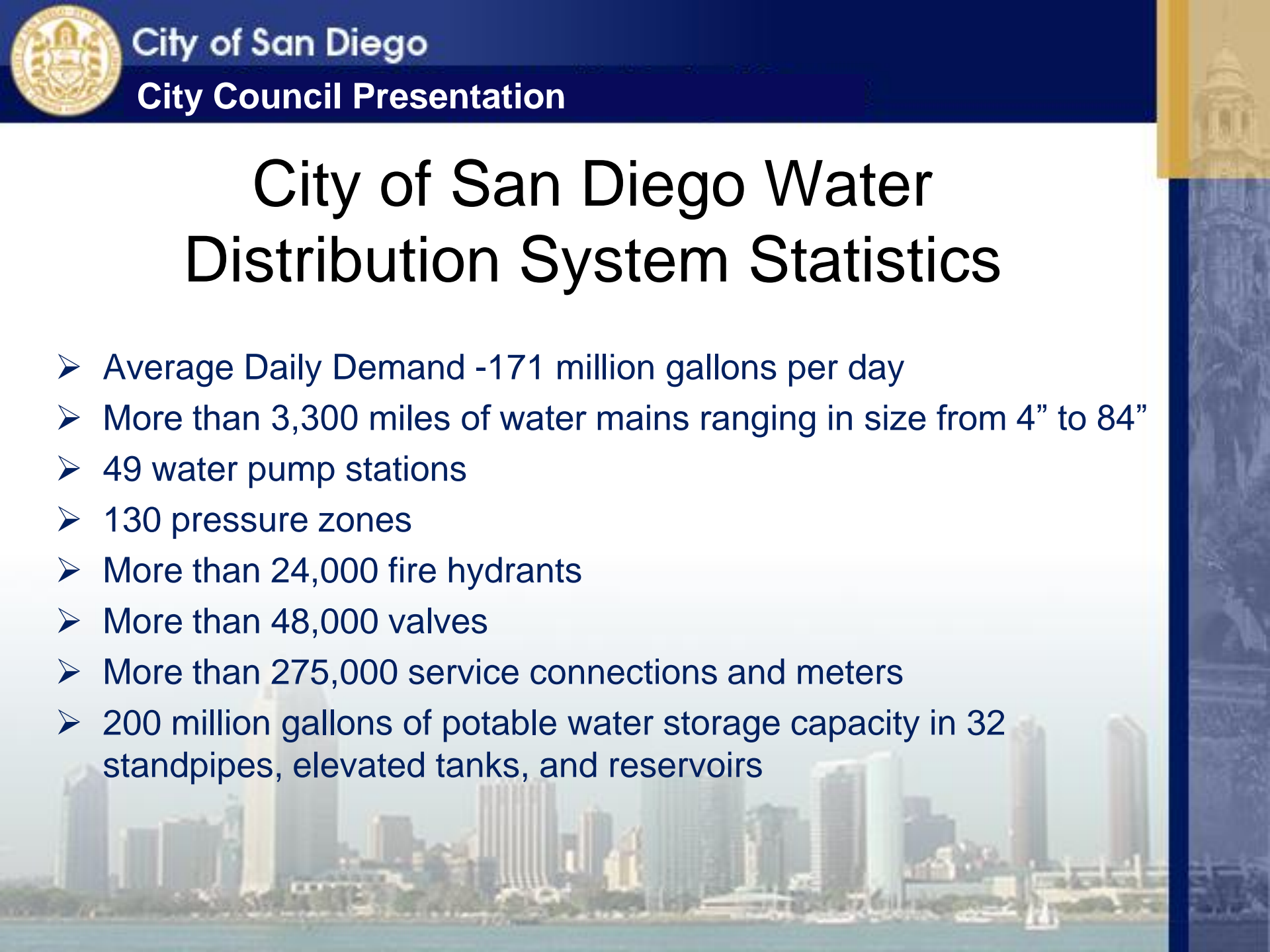
Water Distribution System Water Loss
("Unaccounted for Water")

*Presentation to
NR&C Committee
August 3, 2011*



City of San Diego Water Distribution System Statistics

- Average Daily Demand -171 million gallons per day
- More than 3,300 miles of water mains ranging in size from 4" to 84"
- 49 water pump stations
- 130 pressure zones
- More than 24,000 fire hydrants
- More than 48,000 valves
- More than 275,000 service connections and meters
- 200 million gallons of potable water storage capacity in 32 standpipes, elevated tanks, and reservoirs





Distribution System Water Loss

- Distribution system water losses are typically defined as water that is “unaccounted for” when comparing water delivered into the distribution system to the sum of water sold to customers and unbilled authorized uses
- The Water Industry generally uses the amount of “unaccounted for water” as a way to evaluate and audit the overall management of the water system





“Unaccounted for Water” Industry Standards

- In 1991, the California Urban Water Conservation Council (CUWCC) established a best management practice (BMP) for water agencies to achieve less than 10% “unaccounted for water”
- The International Water Association (IWA) and the American Water Works Association (AWWA) subsequently developed standard methods and terminology to perform water audits
- In September 2009, the CUWCC amended the Water Loss and Control BMP to reflect the new IWA/AWWA methodology





IWA Standard Water Balance



System Input Volume	Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption	Revenue Water
			Billed Unmetered Consumption	
	Water Losses	Unbilled Authorized Consumption	Unbilled Metered Consumption	Non Revenue Water
			Unbilled Unmetered Consumption	
		Apparent Losses	Unauthorized Consumption	
			Customer Meter Inaccuracies	
		Real Losses	Leakage on Transmission and Distribution Mains	
			Leakage and Overflows at Storage Tanks	
			Leakage on Service Connections up to point of Customer Meter	



“Unaccounted for Water” Statistics

- National average as reported by the US EPA 14%
- **City of San Diego:** Population 1,300,000; **9.3%** (2010)
- **East Bay Municipal Water District:** Population 1,300,000; **10%** (2010)
- **San Francisco Public Utilities Commission:** Population 835,021; **9%** (2010)
- **Sweetwater Authority:** Population 183,000; **5%** (2010)
- **Philadelphia Water Department:** Population 1,670,000; **31.2%** (2003)
- **Albuquerque Bernalillo County Water Utility Authority:** Population 845,913; **12.5%** (2008)
- **City of Phoenix:** Population 1,512,900; **5.1%** (2007)



Causes of “Unaccounted for Water”

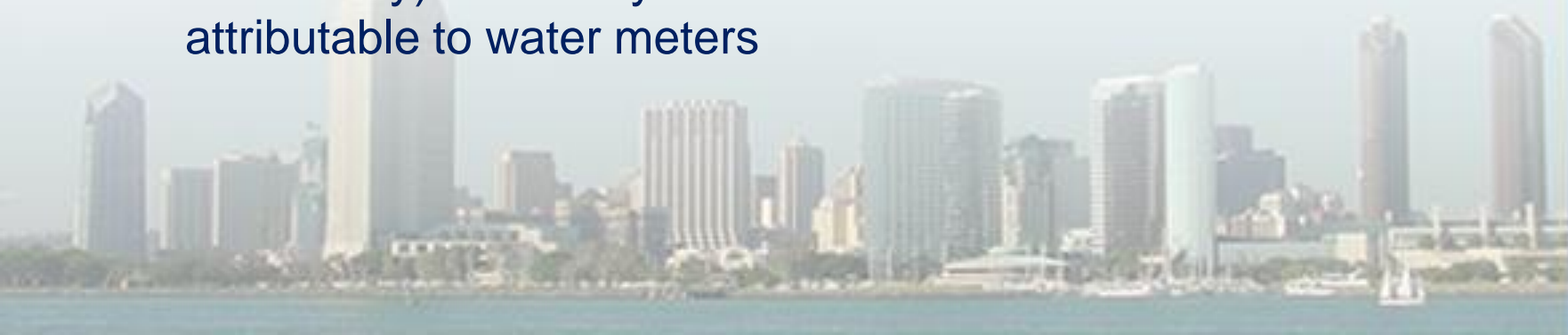
- “Unaccounted for water” occurs in all water distribution systems and is comprised of various factors:
 - meter inaccuracies
 - leaks/breaks on infrastructure
 - illegal fire hydrant usage and/or theft
- It is often difficult to precisely identify the amount associated with each factor





“Unaccounted for Water” Attributable to Water Meters

- According to AWWA, meters have an inherent variation of 2 to 3 percent in registration
- AWWA recommends replacement of meters with accuracy limits less than 96 percent
- Based on testing information, it is estimated that approximately 33 to 40 percent (3 to 5 percent registry inaccuracy) of the City’s “unaccounted for water” is attributable to water meters





Meter Replacement Program

- City has 275,020 meters (273,703 small & 1,317 large)
 - Small meters are currently replaced on a 24-year cycle or when there is an identified failure
 - Large meters are tested annually, and repaired or replaced, as necessary
- Based on current replacement parameters, there are 27,957 meters to replace in FY2012





“Unaccounted for Water” Attributable to Leaks/Breaks

Public Utilities Department prioritizes the investigation and repair of leaks, main breaks and fire hydrant knock-overs

- Department's goal is to repair reported distribution service leaks within 3 working days
- Department's goal is to respond to main breaks and fire hydrant knock-overs within 1 hour

Public Utilities Department's Capital Improvement Program replaces aged infrastructure

- Department has replaced 48.6 miles of old cast iron pipe over the past 3 years and has approximately 90 miles of cast iron pipe remaining to replace over the next 5 to 7 years
- Department's other infrastructure, such as asbestos cement pipe (more than 2,100 miles in the system) is also reaching its useful life and is experiencing an increase in breaks/leaks which will also require replacement



QUESTIONS?

